

Chemistry I: How to solve solubility problems using a Solubility-Temperature Graphs.

Three types of information can be derived from the use of these graphs.

1. Directly reading the graph to determine how many grams of a compound will dissolve in 100 mL (or 100 g) of water.
2. Determine how many grams of a compound will dissolve in more or less than 100 mL (or 100 g) of water. This is done by using a set of ratios

a. Example:

- i. How many grams of KCl will dissolve in 300 mL of water at 45 °C?

$$1. \frac{42g}{100mL} = \frac{x}{300mL} \quad X=126 \text{ g KCl}$$

3. .How many grams can be added or how many grams will precipitate out of a solution if the temperature changes. This can be done by determining the differences between the two points on the solubility graph.

a. Examples :

- i. If a solution of NaNO_3 is heated from 40°C to 70°C, how many more grams will dissolve in 100g of water?

$$131g - 101g = 30g$$

30 g NaNO_3 can be added

- ii. How many grams of CsCl will precipitate out of solution if the solution is cooled from 20°C to 0°C?

$$184g - 160g = 24g \quad 24 \text{ g CsCl will}$$

precipitate